REMARKS

1. Status of the Claims

Claims 1-15 stand pending. Claims 1-15 were rejected in the office action mailed March 25, 2008.

Applicants note that the Examiner's rejection of "claims 1-19" in the office action appears to be a typographical error. Clarification is requested.

2. Information Disclosure Statement

Applicants note with appreciation the Examiner's acknowledgement of the Information Disclosure Statement filed December 28, 2004. Applicants attach herein a full translation of JP H09-75003A, which the Examiner already has considered. No fees are due for submission of the full translation of this reference.

3. Rejection of the Claims Under 35 U.S.C. § 103(a)

Claims 1-15 are rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 4,758,444 or 4,871,562 ("Terauchi I and II") alone or, if necessary, as further evidenced by Minifie (1980, *Chocolate, Cocoa and Confectionery*, 2nd Ed., AVI Publishing Co., Inc., Westport CT, p. 69) ("Minifie"). Additionally, claims 1 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,389,394 ("Weyersbach") as further evidenced by Minifie. Further, claims 1-4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent Abstract No. 09-075003 ("Takashi") as further evidenced by Minifie. Applicants respectfully disagree with all three obviousness rejections and submit that the claims are not obvious for the following reasons.

The test which must be met for a reference or a combination of references to establish obviousness has not been satisfied in the present rejection. The MPEP states, in relevant part, the proper test for obviousness as follows:

> Office policy is to follow *Graham v. John Deere Co.* in the consideration and determination of obviousness under 35 U.S.C. 103... [T]he four factual

inquires enunciated therein as a background for determining obviousness are as follows:

(A) Determining the scope and contents of the prior art;

(B) Ascertaining the differences between the prior art and the claims in issue;

(C) Resolving the level of ordinary skill in the pertinent art; and

(D) Evaluating evidence of secondary considerations. MPEP § 2141.

Additionally, 35 U.S.C. § 103(a) provides, in relevant part, that "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." None of the rejections set forth by the Examiner meets this burden.

3.1 Rejection of claims 1-15 over Terauchi I or II in view of Minifie

Terauchi I and II discloses a process for obtaining a mixture of a water-soluble portion and a ***fine particle portion*** from cacao mass or cocoa powder (Terauchi I/II at col. 1, lines 9-16). Specifically, the method of Terauchi uses cacao mass (ground cacao nibs), which contains insoluble fine particles. An extract obtained by the method thus contains fine particles. Terauchi ***purposely*** leave fine particles contained in an extract as an essential ingredient. *See, e.g.*, Terauchi I/II, col. 3, lines 36-51.

In the method disclosed in Terauchi, it is necessary to remove coarse particles having a relatively large size, although fine particles should remain contained in an extract. To this end, the method of Terauchi requires a complex process under a controlled condition. *See, e.g.*, Terauchi I/II, col. 4, lines 15-26. In fact, in Example 2 in Terauchi I/II, an extract from cacao mass was centrifuged with relatively week centrifugal force (1000 G), leaving fine particles in the water-soluble portion. If the extract is centrifuged with a higher centrifugal force, the fine particles also may be removed, however, Terauchi I/II teach away from removal of fine particles, as set forth above.

By contrast, the claimed method comprises extracting cacao nibs, so that insoluble solids, especially fine particles, are not extracted or minimally extracted. The method of the present invention thus does not require complex processes for dividing cacao nibs to produce cacao mass or cacao powder or processes for removing insoluble solids including fine particles. Further, cacao powder is undesirable as a source material, because the fine particle insoluble solids in cacao powder are difficult to remove, and these solids ultimately contribute to a final product of undesirable texture and taste. By contrast, the chocolate drink produced by the present invention method only contains ingredients that are suitable for use in beverages and has a smooth texture in the mouth without graininess. *See, e.g.*, specification, page 24, line 19, *et seq*.

Minifie is relied upon by the Examiner solely for its teaching related to the constitution and general properties of cocoa butter. Minifie thus does not correct the deficiencies of Terauchi I/II. As the references when viewed alone or in combination do not teach the claimed matter, there is no *prima facie* case of obviousness. The rejection thus should be withdrawn.

3.2 Rejection of claims 1 and 7 over Weyersbach in view of Minifie.

Weyersbach is directed to a process of producing a water-soluble virtually ***fat-free*** cocoa extract. *See, e.g.*, Weyersbach, col. 1, lines 37-44. This is completely different from the claimed invention, which recites that the drink produced by the method is a ***fat/oil-rich*** chocolate drink.

Weyersbach's method is specialized for obtaining a virtually fat-free extract. Specifically, Weyersbach must extract broken cocoa seeds in a static fixed bed at atmospheric pressure without mechanical loading. *See, e.g.*, Weyersbach, col. 1, lines 55-68. Weyersbach does not produce a cacao fat/oil-rich chocolate drink. In fact, Weyersbach clearly teaches away from extraction of cacao fat/oil. *See, e.g.*, Weyersbach, col. 1, lines 37-44. Further, Weyersbach does not teach or suggest a step of removing insoluble solids, as claimed. Thus, the present invention is not obvious over Weyersbach. The deficiencies of Weyersbach are not corrected by Minifi. The rejection accordingly should be withdrawn.

3.3 Rejection of claims 1-4 over Takashi in view of Minifie.

An English translation of Takashi is attached hereto as Exhibit 1.

Takashi does not teach or suggest removing insoluble materials from an extract at a temperature higher than the melting point of cacao fat/oil. Rather, Takashi teaches that removal of fine insoluble substances should be conducted 25°C or lower. *See, e.g.*, Takashi, paragraph [0017]. Therefore, the presently claimed method, which comprises removing insoluble solids from an extract at a temperature higher than the melting point of cacao fat/oil, is not obvious from Takashi. The deficiencies of Weyersbach are not corrected by Minifi. As the references when viewed alone and in combination do not suggest the claims, no *prima facie* case of obviousness is evinced. The rejection accordingly should be withdrawn.

CONCLUSION

In conclusion, this is believed to be in full response to the outstanding Office Action. No new matter has been added by way of this amendment. Applicants request reconsideration and reexamination of this application and the timely allowance of the pending claims. Should any issues remain outstanding or if there are any questions concerning this paper, or the application in general, the Examiner is invited to telephone the undersigned representative at the Examiner's earliest convenience.

Should any outstanding fees be owed or overpayments credited, the Commissioner is invited to charge or credit Deposit Account No. 50-0573.

Respectfully submitted,

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Dated: July 25, 2008

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Exhibit 1

English language translation of JP H09-75003 A ("Takashi")

Translation of JP H09-75003A

(54) [Title of the Invention]

METHOD FOR PRODUCING EXTRACTED CACAO LIQUID, CACAO EXTRACT, OR FOODS CONTAINING THESE

(57) [Abstract]

[Object]

Provided are a method for producing an extracted cacao liquid, a cacao extract, or foods utilizing the liquid or extract, having a straight taste, by processing unroasted whole cacao beans without removing shells and embryos thereof.

[Constitution]

A crushed product of unroasted whole cacao beans (inclusive of shells and embryos) is treated with an alkali agent solution so as to have a pH of 6.5 to 8.0, allowed to react and to be dried at 90 to 110°C for 1 to 4 hours. Then, to the reaction mixture, water is added for extraction at 85 to 120°C for 10 to 30 minutes, and then the extract obtained is subjected to removal of the insoluble substances and the fat/oil contents by means of centrifugal separation and filtration to produce an extracted cacao liquid. Additionally, the extract liquid is dried to produce a cacao extract that is a dried powder. Further, a food is produced by blending, as one of raw materials, the extracted cacao liquid, a concentrated liquid obtained therefrom, or the cacao extract.

[Claims]

[Claim 1]

A method for producing an extracted cacao liquid, the method being characterized, in steps in which whole cacao beans are selected, the selected whole cacao beans are crushed without being roasted by means of a crushing roll, the crushed product of the whole cacao beans with shells and embryos mixed therein is subjected to alkali treatment, added with water, and heated and extracted, and the extract obtained is subjected to centrifugal separation and filtration to produce an extracted cacao liquid, in that:(a) the crushed product of the whole cacao beans is used as a raw material; (b) an alkali agent is added in such a way that the pH of the extracted cacao liquid obtained after alkali treatment is 6.5 to 8.0; and (c) water is added to the crushed product of the whole cacao beans and heated and extracted under conditions of 85 to 120°C.

[Claim 2]

The method for producing an extracted cacao liquid according to claim 1, characterized in that, in the steps of producing the extracted cacao liquid, the extract liquid obtained by extraction and centrifugal separation is filtered by using a filter paper or a non-woven fabric made of propylene, to obtain an extract liquid substantially free from fat/oil contents.

[Claim 3]

A method for producing a cacao extract, characterized in that the extracted cacao liquid obtained by the production method according to claim 1 or 2 is subjected to usual drying treatment to produce the cacao extract.

[Claim 4]

A method for producing a food, characterized in that the food contains, as part of the blending raw materials thereof, the extracted cacao liquid obtained by the production method according to claim 1 or 2 or a concentrated liquid obtained therefrom, or the cacao extract obtained by the production method according to claim 3.

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

The present invention relates to a method for producing a cacao extract utilizing unroasted whole cacao beans.

[0002]

[Conventional Art]

In the production of chocolate and cocoa, cacao beans fermented and dried in production areas are imported, roasted, thereafter shells and embryos are removed from the roasted cacao beans and thus cacao nibs (albumen) are produced to be used. The reason for this is that the shells and embryos intermingled into chocolate impart a rough texture to the chocolate, and the specific gravities of shells and embryos are large to accelerate the precipitation of cocoa when drunk and thus such cocoa is made inappropriate in quality for eating and drinking. Roasting of cacao beans is conducted for the purpose of bringing out the specific taste of chocolate and cocoa. Usually, in the production of cocoa, for the purpose of enhancing cocoa taste and cocoa color tone, an alkali treatment is conducted after roasting of cacao beans. A general method for producing cocoa includes the steps of: selecting, roasting, crushing, de-shelling and selecting, alkali treating and grinding of cacao beans; the step of compression for cacao butter; and the step of crushing and milling of cocoa cake. As can be seen from production method, cocoa includes water-soluble contents and water-insoluble contents of cacao nibs, and hence cocoa includes grains having such grain sizes that impart a rough sensation to

the tongue even after milling, and when taken as beverage, powdery taste is sensed as the case may be. Although cocoa has a specific taste, the taste is different from the taste of chocolate; thus, cocoa beverages are favored and the development of various beverages having chocolate taste is also being investigated.

[0003]

For the purpose of overcoming the powdery taste of cocoa beverages, or developing beverages offering chocolate taste sensation rather than cocoa taste sensation, techniques to develop soluble or transparent cocoa beverages or chocolate beverages having chocolate taste have hitherto been explored by using, as a raw material, cacao nibs, cacao mass or cocoa powder. Proposed examples of such techniques include: (1) a method in which a cocoa powder is subjected to enzyme treatment, and then subjected to clarification treatment by conducting an alkali treatment and an acid treatment to produce a transparent cocoa beverage (Japanese Patent Publication No. 52-12269); (2) a method in which a component containing a water soluble fraction and a fine grain fraction is extraction-separated from a cacao mass or a cocoa powder subjected to alkali treatment after roasting, by using hot water that contains or does not contain ethanol, or a component containing a water soluble fraction and a fine grain fraction is extraction-separated by subjecting a cacao mass or a cocoa powder to an alkali treatment by using alkali agent-containing hot water that contains or does not contain ethanol (Japanese Patent Publication No. 1-42657); (3) a method in which first, a cocoa powder is subjected to ethanol

extraction, and the resulting residual material is partially subjected to enzyme treatment and then an extraction with water to yield soluble cocoa (Japanese Patent Laid-Open No. 3-27250); (4) a method in which heated water is made to flow over crushed cocoa seeds (cocoa nibs) placed in a large number of fixed beds, the extract due to the heated water moves in each of the fixed beds in a counter-current distribution manner so as for the extract to be concentrated, and thus a cocoa extract is produced (Japanese Patent Laid-Open No. 3-94640); and (5) a method in which when extraction is conducted after roasting by adding water to a cacao mass or cacao nibs, an enzyme treatment is conducted to provide a chocolate beverage which offers, when drunk, a light and soft sensation to the palate and additionally a mellow chocolate-like, savory taste (Japanese Patent Laid-Open No. 7-79749).

[0004]

Additionally, the above-described proposed examples also include, as a technique for obtaining a cocoa-like substance from cacao beans, (6) a method for producing a cocoa raw material in which roasted cacao beans with shells are subjected to removal of an astringent taste, aged, pressed or not pressed for oil, then instantly frozen in liquid nitrogen, and converted into a fine powder in a low-temperature gas atmosphere (Japanese Patent Publication Nos. 56-28497 and 56-28498).

[0005]

As described above, in conventional techniques for producing cocoa, cocoa-like substances or cocoa exracts, most of these techniques adopt roasted cacao beans as raw materials; as only

one case where unroasted cacao beans are used, the above-described (4) cites a reference document (West Germany Patent Application Publication No. 2,342,177). However, in this document, although unroasted cacao nibs are used, the cacao nibs do not contain shells and embryos, and no alkali treatment of cacao nibs is conducted.

[0006]

[Problems to be Solved by the Invention]

The present invention relates to a method for producing a cacao extract from cacao beans, in particular, a method for economically producing a cacao extract containing neither oil nor fat and having an excellent cacao taste by utilizing together with cacao nibs, the shells and embryos of cacao beans accounting for approximately 13% of the whole cacao beans, without discarding the shells and embryos as having hitherto been discarded in most cases.

[0007]

When chocolate or cocoa is produced, the shells and embryos of cacao beans accounting for approximately 13% by weight of the whole cacao beans are usually discarded as waste materials ("Theory and Practice of Chocolate and Cocoa Production," by Yoshitsugu Nakanishi, published by Korin Shoin, p.95) because, as described above, the shells and embryos intermingled into chocolate impart rough texture to the chocolate, and the specific gravities of shells and embryos are large to accelerate the precipitation of cocoa when drunk and thus such cocoa is made inappropriate in quality for eating and drinking. However, when a cacao extract is produced, this is an extracted material,

hence does not result in inclusion of the insoluble substances being originated from the cacao beans and offering a cause for rough texture, and consequently even the presence of the shells and embryos (non-extractable substances) in the raw material does not raise any problem. Instead, when a cacao extract is produced, the non-extractable residue has to be discarded; however, the discarding, before extraction, of the shells and embryos accounting for approximately 13% of the whole cacao beans significantly affects the extraction yield, and hence, it is probably economically advantageous if the shells and embryos can be utilized effectively.

[0008]

In addition to the above-described problems of the rough texture and powdery taste in the production of chocolate and cocoa, the utilization of the shells and embryos of cacao beans raises a problem that it is necessary to remove miscellaneous unpleasant tastes including an astringent taste originating from the shells and embryos. For the purpose of solving this problem, in the above-described reference document (6) (Japanese Patent Publication Nos. 56-28497 and 56-28498), the removal of an astringent taste is conducted by adsorbing alcohol or a protein regulating solution to the surface of a raw material and by subsequent aging; however, this method is cumbersome because it is necessary to prepare alcohol or the protein regulating solution, and also because a long time (15 to 24 hours) aging is needed to raise an economic problem; and accordingly, a simpler and more economical removal method of an astringent taste is demanded.

[0009]

On the other hand, in conventional cacao beverages using extracted cacao liquid obtained from roasted cacao nibs, the fat/oil content of the cacao nibs is large and it is difficult to prevent the intermingling of the fat/oil into the extract; strict implementation of the separation of the fat/oil complicates the production process; or there are involved problems such as a problem that it is necessary to add an emulsifying agent to cacao beverages for the purpose of preventing isolation of the fat/oil intermingled into the beverages.

[0010]

[Means for Solving the Problems]

The present inventors investigated various methods for solving the above-described problem, namely, the problem of utilizing the shells and embryos of cacao without discarding them, in particular, made various investigations for the purpose of establishing a method for removal of miscellaneous unpleasant tastes of the shells and embryos, and a method for preventing the fat/oil from being intermingled into beverages, to reach the present invention. Hereinafter, the present invention is described in detail.

[0011]

As has been described in the paragraphs for "Conventional Art," conventional cacao products are all based on the roasting of the raw materials irrespective as to whether the products are chocolates, cocoas, chocolate beverages, or fertilizers or animal feeding stuffs, or irrespective as to whether the

products use only cacao nibs, cacao nibs with shells and embryos intermingled therewith, or only shells and embryos. However, in the reference document (4) described in "Conventional Art," a cocoa extract has been obtained from cacao nibs; although no description is found in the reference document about whether the cacao nibs have been roasted cacao nibs or not, it is valid to judge that roasting has been conducted from a description of "containing 2% of water" therein.

[0012]

The present inventors first focused attention on the fact that the content of theobromine, considered as a causative substance for the bitter taste and astringent taste of the cacao shells, is fairly lower than the content of theobromine in the cacao nibs. Accordingly, it has been assumed that the removal of a stringent taste from the shells and embryos is possible without using alcohol or a protein regulating solution, and the investigation has been advanced to invent the method described below.

[0013]

First, the whole cacao beans imported as having been fermented and dried are seleced, and thereafter crushed without roasting by means of a crushing roll; the cacao bean crushed product obtained herein which contains all the shells and embryos of the whole cacao beans is defined as the crushed product of whole cacao beans.

[0014]

Next, a 30 to 70% by weight solution of an alkali agent such as potassium carbonate is added to the crushed product of

unroasted whole cacao beans (the addition amount of the alkali agent is set in such a way that the pH of an extracted liquid after the alkali treatment of the crushed product of whole cacao beans is 6.5 to 8.0) and sufficiently mixed, and thereafter the mixture is allowed to react and to be dried at 90 to 110°C for 1 to 4 hours. When the pH is less than 6.5, the reaction is insufficient, and when the pH exceeds 8.0, the pungent odor due to the alkali agent becomes too strong. At 90°C and for less than 1 hour, the reaction and the drying are insufficient, and at higher than 110°C and for more than 4 hours, a scorched odor is sensed and, at the same time, a disadvantage from economical viewpoint is also caused.

[0015]

After drying, water or heated water is added to the alkali-treated, crushed product of whole cacao beans in an amount of 3 to 20 volumes of the crushed product, and extraction is conducted at 85 to 120°C. At 100°C or lower, extraction is conducted for 15 to 30 minutes with a usual open-system extraction apparatus, and at higher than 100°C, extraction is conducted for 10 to 20 minutes with a usual closed-system extraction apparatus. Extraction at 100°C or lower and for less than 15 minutes, or at a temperature exceeding 100°C and for less than 10 minutes results in insufficient extraction. Extraction at 100°C or lower and for more than 30 minutes, or at a temperature exceeding 100°C and for 20 minutes or more results in a wasteful spending of energy because no increase of the extraction efficiency is found. Moreover, with less than 3 volumes of water or the like, water or the like is not uniformly

distributed over the whole crushed product of whole cacao beans, and thus, inappropriately the treatment becomes non-uniform; with more than 20 volumes of water or the like, uneconomically a large-scale extraction vessel is needed, and additionally no increase of the extraction efficiency is found.

[0017]

After extraction, it is possible to conduct solid-liquid separation by applying operations such as centrifugal separation and filtration to yield an extracted liquid; for the purpose of removing fine insoluble substances and the fat/oil contents, the centrifugal separation is preferably conducted under conditions of 25°C or lower and 9000G or more. At a temperature exceeding 25°C, the liquid fraction of the fat/oil contents is not sufficiently solidified, and hence a large amount of the fat/oil is intermingled in the extracted liquid. This is not preferred. By the centrifugal separation, most of the fat/oil contents in the extracted liquid are removed; however, for the purpose of completely removing the fat/oil contents, filtration is conducted by using a filter paper (for example, Kimwipe; manufactured by Jujo-Kimberly Co., Ltd.) or a non-woven fabric made of propylene (for example, Kimtex; manufactured by Jujo-Kimberly Co., Ltd.).

[0018]

The extracted cacao liquid obtained by the above-described processing is subjected to appropriate pH adjustment, and can be used as it is or as a concentrated liquid, or can be used as a powder by converting the extract into a powder by means of a usual drying method such as spray drying or freeze drying; the

present extract has a straight cacao taste free from the sensation of miscellaneous unpleasant tastes such as an astringent taste, or free from odors such as a scorched odor or an alkali odor. It is to be noted that an extract containing no fat/oil contents can be obtained by using as a raw material a crushed product of defatted whole cacao beans and by applying the same operations as described above; in this case, no operation for removing fat/oil is necessary.

[0019]

The above-described alkali treatment is not so different from the usually conducted alkali treatment; in this case, essential is the use of a crushed product of unroasted whole cacao beans, as a raw material. In other words, when a crushed product of roasted whole cacao beans is used as a raw material, a cacao extract having a specific chocolate taste or a specific cocoa taste can be obtained; however, no such an above-described extracted material can be obtained which is free from a scorched odor and has a straight cacao taste, as can be obtained in the case where a crushed product of unroasted whole cacao beans is used. This is probably because the cell tissue of a cacao bean is destroyed by roasting, isolation of fat/oil from the cell wall occurs, oil-soluble taste substances are dissolved into the extract together with the fat/oil at the time of extraction and such taste substances are the origin of the specific chocolate taste or the specific cocoa taste. On the other hand, when a crushed product of unroasted whole cacao beans is used, the cacao cell destruction is light because of no roasting, and hence the isolation of the fat/oil from the cell wall is not

caused, the intermingling of the fat/oil in the extract is low, the extraction of the components to be the origins of the miscellaneous unpleasant tastes is also low, and thus the straight cacao taste is probably obtained.

[0020]

[Embodiment of the Invention]

To a crushed product of whole cacao beans, obtained by crushing whole cacao beans having been fermented and dried, without roasting and with or without secondary drying, a 30 to 70% by weight solution of an alkali agent is added (the addition amount of the alkali agent is set in such a way that the pH of the below-described extract is 6.5 to 8.0), and the mixture is allowed to react and to be dried at 90 to 110°C for 1 to 4 hours. After completion of drying, water is added to the alkali-treated, crushed product of whole cacao beans in an amount of 3 to 20 times the volume of the crushed product, and extraction is conducted at 85 to 120°C for 10 to 30 minutes to yield an extract. The extract is subjected to centrifugal separation and filtration to remove the insoluble components and the fat/oil and thus an extracted cacao liquid is obtained. Thereafter, the pH of the extract is adjusted, and the extract is used as it is, or as a concentrated liquid, or is used as a powder obtained by drying the extract by means of a drying method such as spray drying, as raw materials for beverages and sweet confections. The details of the embodiment are described in the following "Examples."

[0021]

[Examples]

Example 1

Unroasted cacao beans were crushed with a crushing roll, and to 100 g of the crushed product of cacao beans, obtained without removal of shells and embryos, 70 ml of an alkali solution containing 1 g of sodium hydroxide and 1 g of potassium carbonate dissolved therein was added, and the mixture was sufficiently mixed and allowed to react and to be dried at 105°C. After completion of drying, 500 ml of water was added to the alkali-treated, crushed product of whole cacao beans, and heated and extracted in a pressure vessel at 120°C for 10 minutes. After extraction, filtration was conduced with gauze to remove the insoluble coarse grains. The obtained filtrate was subjected to centrifugal separation for 15 minutes under conditions of 10°C and 12000G to remove the fine insoluble substances and the fat/oil contents, and finally the pH of the filtrate was adjusted to be 6.8, and thus approximately 300 ml of an extracted cacao liquid was obtained.

Example 2

In a 100-liter volume autoclave equipped with a stirrer, 5 kg of a crushed product of unroasted cacao beans, obtained in the same manner as in Example 1 was placed, 2 L of an alkali solution containing 75 g of sodium carbonate and 25 g of potassium carbonate dissolved therein was added, the mixture thus obtained was sufficiently mixed, the lid of the autoclave was closed, and the mixture was heated with steam. When 30 minutes elapsed after the temperature of the mixture had reached 90°C or higher, the lid of the autoclave was opened, and the mixture was dried under stirring. After completion of drying, 50

liters of water was added to the mixture and heated and extracted at 90 to 95°C for 30 minutes, and after extraction, filtration was conducted with nylon gauze to remove the insoluble coarse grains. The obtained filtrate was subjected to continuous centrifugal separation under conditions of 20°C and 9500G to remove the fine insoluble substances and the fat/oil contents. Further, the separated liquid was filtered with Kimtex (a non-woven fabric made of propylene, manufactured by Jujo-Kimberly Co., Ltd.), and finally the pH of the filtrate was adjusted to be 6.8, and thus approximately 33 liters of an extracted liquid free from the insoluble substances and the fat/oil contents was obtained. Silica sand was added to 100 ml of the extract, and the extract was evaporated to dryness on a warm bath; the dried substance was put in a cylindrical filter paper, and subjected to extraction of fat with ether by using a Soxhlet extractor; thus the content of crude fat was quantitatively determined, and no crude fat was detected. The extracted liquid obtained herein (5 liters) was four-fold concentrated, and thus 1.2 liters of the concentrated liquid of a cacao extract was obtained. Further, 1 liter of the four-fold concentrated liquid was freeze-dried, and thus 81 g of a dried powder of a cacao extract was obtained.

Comparative Example 1

Cacao beans were roasted according to the usual manner, and thereafter crushed with a crushing roll; the shells and embryos in the cacao beans were removed by means of wind selection, and thus cacao nibs were obtained. In the same manner as in Example 1, 100 g of the cacao nibs were treated, and finally the pH of

the obtained extract was adjusted to be 6.8. Thus, approximately 320 ml of an extracted cacao liquid was obtained.

Comparative Example 2

Cacao beans were roasted in the usual manner, and thereafter crushed with a crushing roll; the shells and embryos in the cacao beans were removed by means of wind selection, and thus cacao nibs were obtained. In the same manner as in Example 2, 5 kg of the cacao nibs were treated, and finally the pH of the obtained extract was adjusted to be 6.8. Thus, approximately 35 liters of an extracted cacao liquid free from insoluble substances and the fat/oil contents was obtained.

Test Example 1

To 1000 parts of a liquid obtained by diluting, to a brix value of 1, each of the extracted cacao liquid obtained in Example 1 and Comparative Example 1, 70 parts of sugar, 10 parts of whole milk powder, 1 part of sodium chloride, 1.5 parts of sugar ester and 0.5 part of a flavoring were added. The mixture obtained was mixed according to the usual manner under heating. After dissolution, the solution was filled in a can and sealed, and subsequently subjected to retort sterilization treatment. Thus, a chocolate beverage was obtained from each of the extracted cacao liquid. The chocolate beverage obtained from the extracted cacao liquid of Example 1 and the chocolate beverage obtained from the extracted cacao liquid of Comparative Example 1 were subjected to comparison of taste by applying an organoleptic test conducted by a panel of 50 experts. The results thus obtained are shown in Table 1; although no significant difference in relative merits in taste was found

between Example 1 and Comparative Example 1, the taste characteristics were such that the chocolate beverage of Example 1 offered a straight and refreshing taste absolutely free from the sensation of a scorched odor and miscellaneous unpleasant tastes such as a bitter taste and an astringent taste.

[Table 1]

Chocolate beverage	The number of the panelists who determined that Example 1 was preferable in taste to Comparative Example 1 (out of 50 panelists)	Taste characteristics	
		The number of the panelists who determined that a scorched odor and miscellaneous unpleasant tastes were sensed (out of 50 patients)	The number of the panelists who determined that the tastes was a straight and refreshing (out of 50 panelists)
Example 1	27 panelists[a)]	3 panelists[c)]	33 panelists[e)]
Comparative Example 1	23 panelists[b)]	14 panelists[d)]	19 panelists[f)]

a), b) No significant difference was found on the determination that Example 1 was preferable to Comparative Example 1.

c), d) A significant difference was found between Example 1 and Comparative Example 1 on the determination that a scorched odor and miscellaneous unpleasant tastes were not sensed, as to whether the scorched odor and miscellaneous unpleasant tastes were sensed.

e) A significant difference was found for Example 1 on the determination that a straight and refreshing taste was sensed.

f) No significant difference was found for Comparative Example 1 on the determination that a straight and refreshing taste was sensed.

Test Example 2

To 1000 parts of a liquid obtained by diluting, to a brix value of 1, each of the extracted cacao liquid obtained in Example 2 and Comparative Example 2, 70 parts of sugar, 10 parts of whole milk powder, 1 part of sodium chloride, 1.5 parts of sugar ester and 0.5 part of a flavoring were added. The mixture obtained was mixed according to the usual manner under heating. After dissolution, the solution was filled in a can and sealed, and subsequently subjected to retort sterilization treatment. Thus, a chocolate beverage was obtained from each of the extracted cacao liquid. The chocolate beverage obtained from the extracted cacao liquid of Example 2 and the chocolate beverage obtained from the extracted cacao liquid of Comparative Example 2 were subjected to comparison of taste by applying an organoleptic test conducted by a panel of 50 experts. The results thus obtained are shown in Table 2; although no significant difference in relative merits in taste was found, the taste characteristics were such that the chocolate beverage of Example 1 offered a straight and refreshing taste free from the sensation of a scorched odor and miscellaneous unpleasant tastes such as a bitter taste and an astringent taste.

[Table 2]

Chocolate beverage	The number of the panelists who determined that Example 1 was preferable in taste to Comparative Example 1 (out of 50 panelists)	Taste characteristics	
		The number of the panelists who determined that a scorched odor and miscellaneous unpleasant tastes were sensed (out of 50 patients)	The number of the panelists who determined that the tastes was a straight and refreshing (out of 50 panelists)
Example 1	26 panelists[a)]	7 panelists[c)]	37 panelists[e)]
Comparative Example 1	24 panelists[b)]	16 panelists[d)]	23 panelists[f)]

a), b) No significant difference was found on the determination that Example 2 was preferable to Comparative Example 2.

c), d) A significant difference was found between Example 2 and Comparative Example 2 on the determination that a scorched odor and miscellaneous unpleasant tastes were not sensed, as to whether the scorched odor and miscellaneous unpleasant tastes were sensed.

e) A significant difference was found for Example 2 on the determination that a straight and refreshing taste was sensed.

f) No significant difference was found for Comparative Example 1 on the determination that a straight and refreshing taste was sensed.

Example 3

A chocolate ice candy was prepared by using the extracted cacao liquid obtained in Example 1, according to the composition shown in Table 3 by using a usual preparation method.

[Table 3] Composition of chocolate ice candy

Sugar	100 parts by weight
Starch syrup	30 parts by weight
Isomerized sugar	50 parts by weight
Extracted cacao liquid	120 parts by weight
Stabilizer	3 parts by weight
Water	880 parts by weight
Flavoring	1.2 parts by weight

A refreshing ice candy offering a pleasant cooling sensation was obtained.

Example 4

The extracted cacao liquid (brix value: 2.2) obtained in Example 2 was diluted to a brix value of 1, and then the pH of the extract was adjusted to be 6.8. Thereafter, a transparent cacao beverage was prepared according to the composition shown in Table 4 by using a usual method.

[Table 4] Composition of cacao beverage

Extracted cacao liquid	1000 parts by weight
Sugar	55 parts by weight
Flavoring	0.5 parts by weight

A light and refreshing cacao beverage free from insoluble substances and fat/oil contents was obtained.

Example 5

A chocolate jelly was prepared by using the powder of a cacao extract obtained in Example 2 according to the composition shown in Table 5 by using a usual preparation method.

[Table 5] Composition of chocolate jelly

Morinaga cook gelatin[a)]	10 parts by weight
Sugar	50 parts by weight
Powder of cacao extract	5 parts by weight
Flavoring	0.28 parts by weight
Water	500 parts by weight

a) Gelatin powder manufactured by Morinaga & Co., Ltd.

A clear chocolate jelly containing free from fat/oil contents and offering a pleasant cooling sensation was obtained.